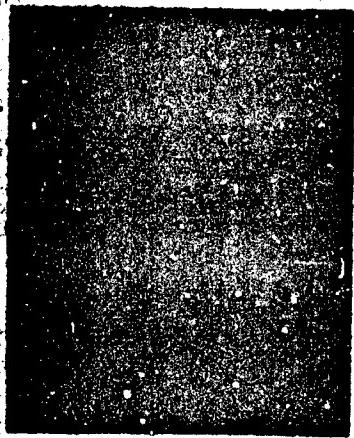


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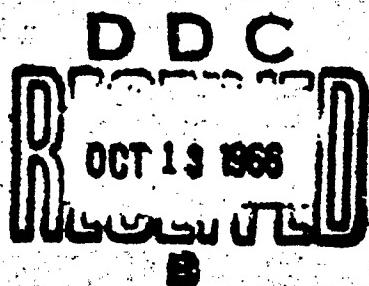
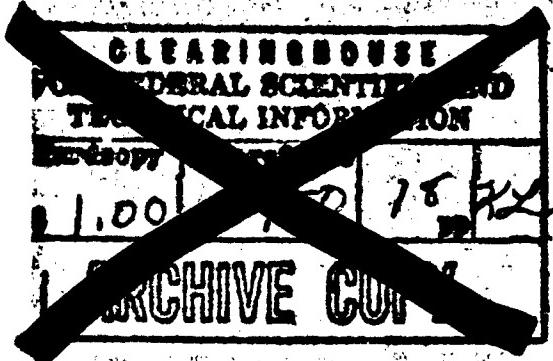


Technical Report

AD 640 117

MECHANIZATION STUDY  
OF THE  
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Cameron Station, Virginia

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BOOZ-ALLEN APPLIED RESEARCH INC.

WASHINGTON  
CLEVELAND  
CHICAGO  
LOS ANGELES

## **ABSTRACT**

Computer mechanization at the Marine Engineering Laboratory (MEL) Library presently consists of production of a journal listing on an IBM 1401 computer from punched cards. When the computer file of information on reports is expanded, it will be the data base for bibliographic searches and retrieval of information. This data base will be maintained and processed by the Information Storage Package, a series of computer programs developed by the Applied Physics Laboratory of Johns Hopkins University. The MEL Library feels that, while the Information Storage Package is useful, a universally accepted information system would be more beneficial for all aspects of library mechanization; with such a system, centralized cataloging might become feasible.

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## I. SUMMARY

Mechanization by computer at the Marine Engineering Laboratory (MEL) Library is limited at present. Punched cards are being used to produce a journal listing on the IBM 1401. Information on approximately 500 reports has been added to the computer file and, when expanded, will be the data base for bibliographic searches and retrieval of information. This data base will be maintained and processed by the Information Storage Package, a series of computer programs developed by the Applied Physics Laboratory (APL) of Johns Hopkins University. The APL thesaurus and synonym listing is used for indexing and searching. Programs for processing accessions lists, renewal order forms, periodical holdings lists, and periodical routing lists are planned for the future.

The book collection numbers about 11,000, with an annual growth of 1,000; technical reports number 60,000 - 65,000 with an annual growth of 2,000 - 2,500, and periodical subscriptions now number 280 with only 5 to 10 titles added per year. The technical reports collection includes both classified and unclassified items.

Major subject areas covered are engineering (marine, mechanical, electronic, and electrical), chemistry, physics, and mathematics.

The Library has a staff of two professionals and two clerical assistants, but both of the clerical positions are vacant at this time.

The Library serves the Marine Engineering Laboratory's 900 personnel and, under a reciprocal arrangement with the Naval Academy Library, serves Academy personnel also. The largest percentage of the users are engineers and scientists who usually make a visit to the Library for required information. Periodicals and documents are routed to the technical staff as well as to the administrative staff. Interlibrary loan to other activities is limited, although the Library borrows an average of 200 items per month.

## **II. MECHANIZATION**

### **1. DESCRIPTION OF PERIODICALS PROCESSES**

#### **(1) Input Procedures**

**Titles of periodicals to which the Library subscribes are assigned broad subject areas or classes of interest (i.e., management, scientific, etc.) and are forwarded to the Computer Operations Branch for keypunching.**

#### **(2) Output**

**Cards are keypunched and arranged alphabetically in several groups reflecting the broad subject areas or classes of interest. A listing is run periodically using MEL's 1401 computer, which serves to indicate new accessions received by the Library. (For sample of listing, see Appendix A.)**

### **2. DESCRIPTION OF TECHNICAL REPORTS PROCESSES**

**In the present mechanization program, only the currently received items are being added to the computer file. There is some**

possibility that DDC files might be used at some future date to process older items already in the collection when the computer program began, but no firm plans for this have been made.

(1) Input Procedures

1. Incoming reports are checked for duplication. Items requested from DDC by an individual scientist or engineer are sent directly to the requestor without cataloging or processing; items received on distribution and maintained in the Library collection are cataloged.
2. Accession numbers are assigned to each report that is to be cataloged. The cataloger then adds descriptive cataloging information to the input form SRNC-MEL 5070/5 (see Figure 1 for sample), including accession number, classification, report number, AD number, title and author, period covered, pages, date, and contract number.
3. Descriptors selected from the Thesaurus are added to the input form, with each descriptor separated from the next one by a virgule (slash), i.e., guided missile/ testing. (The APL thesaurus allows individual words or phrases to be used as descriptors.)

**FIGURE 1**  
**Input form SRNC-MEL 5070/5**

4. Input forms are forwarded to the Computer.

Operations Branch for keypunching, editing, and updating of the magnetic tape files.

## (2) Output

Since only 400-500 items are presently on the tape, the system has not produced printouts of search requests.

### **3. MAJOR PROBLEMS**

Conversion of the report files to computer format has been delayed by the shortage of both Library and keypunch personnel. When the staff is augmented, a keypunch may be installed in the Library.

While the Information Storage Package is useful, a universally accepted information system would be most welcome for all aspects of Library mechanization; if there were such a system, such activities as centralized cataloging might become feasible.

### **III. PROGRAM SYSTEM DATA**

#### **1. MASTER FILE**

The Master File is made up of variable-length records, each of which has a maximum of 3,500 characters. Each field within a record is delineated by virgules. The fields may contain any combination of characters except / and \$, which are reserved for the system. That is, they may contain title, author, descriptors, abstracts, etc., in any mix.

#### **2. PROGRAMS**

The series of programs which will be used at MEL, called the Information Storage Package, was devised by Fenton Kennedy at the Applied Physics Laboratory and was used in the APL Library until it was replaced by a more powerful series.

The Information Storage Package was reprogrammed (from the 1401 computer) for the 7094 computer at APL. It still performs the programs of Edit, Test, Paragraph Lister, Substitutor, Print, Search, and Scan, but adds one program, the Alphabetical Listing.

This program compares a tape file with a list of descriptors that are also on tape. The output may be either an alphabetical listing of the descriptors on the master file or an alphabetical listing of those descriptors on the master file which are not on the thesaurus tape, or both.

The Information Storage Package has not been used in the MEL Library to any extent, since file conversion has not yet been effected. Of the following programs, the only one that is presently in use at MEL is the Edit Program.

(1) Edit

This program is used to establish and maintain a standard file of descriptive and bibliographic data. It accepts as input a deck of change cards describing the editing operations to be performed on zero, one, or two previous files. A single new file is the result.

New records, bound text, free text, indented free text, free text line for line or one card per line may be inserted into the file. One or more records may be deleted. Any string of characters may be replaced by any other string of characters. A record may be split into two records, or two consecutive

records may be combined into one. Any sequence of records from the old file may be inserted into the new file.

(2) Test

This is a preeditor for the Edit Program. It will read a deck of change cards, review the contents, and print each card with a notification of format errors detected.

(3) Paragraph Lister

The Paragraph Lister Program will print a tape file, record by record, in a form convenient for preparing input to the edit program. The paragraph is headed by the numbers 1 to 100 with space between each group of 10 characters ; the lines are numbered 0 to 9 and A to Y.

(4) Substitutor

This program will replace specified strings of characters in a tape file by other specified strings of characters. For example, the request to replace ABC by DEFG causes the computer to search the file and to insert DEFG in place of each occurrence of ABC in the file.

(5) Print

The Print Program will print one or more magnetic tape files in a flexible format that can be changed from one file to the next by control cards. Control card parameters specify the characters of each record to be printed, margin locations, indentation, spacing, justification, paging, record selection, headings, file control, and other printing options.

(6) Search

This program will read a deck of cards containing one or more search requests, will match the requests against the file, and will create a new file containing all records that satisfy the request. That tape may be printed or may be used for additional searches in the first file of the tape. An on-line listing is also provided indicating the number of records which satisfied each request. In addition, error messages are provided.

The search requests are punched on one or more cards in free-text format. They are made up of descriptors (strings of characters bounded by virgules) and logical operators (AND, INCLUSIVE OR, NOT, LESS OR EQUAL, EQUAL, GREATER OR EQUAL).

(7) Scan

This program is similar to the Search Program, but the search description will be limited to a single descriptor with no logical operators. This restriction permits much faster operation. Multiple reels may be scanned to produce a single tape file. The primary advantage of the Scan Program is in reducing the file size for a number of subsequent, detailed searches.

#### **IV. EQUIPMENT AND COSTS**

##### **1. EQUIPMENT**

The MEL computer facility currently rents a large IBM 1401 computer which is run two shifts for solving scientific problems and a few management problems. Most routines are written in FORTRAN or COBOL. The 1401 component list is as follows:

1401	16K memory
1402	card reader/punch
1403	printer (132 characters)
5      7330	tape units

##### **2. COSTS AND TIME**

Development costs were absorbed by APL and were minimized by the adoption of a system that was already in use. The system was obtained by MEL essentially free. The librarian made several trips to APL for familiarization, and the cataloger spent three days there actually cataloging for the system.

## BIBLIOGRAPHY

"Memorandum to Distribution on Information Storage Package,"  
from Olmer, Peebles, Rich, and G. B. Swartz, BCC 294,  
revised 1 April 1964.

**APPENDIX A**

**SAMPLE OF PERIODICALS LISTING**

LIST (E)

AMERICAN INDUSTRIAL HYGIENE ASSOCIATION. JOURNAL. CODE 163.1  
AMERICAN MACHINIST/METALWORKING MANUFACTURING. CODE 280.  
AMERICAN SOCIETY FOR METALS. TRANSACTIONS. CODE 257  
AMERICAN SOCIETY FOR TESTING AND MATERIALS. STANDARDS. CODE 257  
AMERICAN SOCIETY OF METALS. REVIEW OF METAL LITERATURE. ANNUAL. CODE 25  
APPLIED SCIENCE AND TECHNOLOGY INDEX. CODE 257  
A.T.D. PRESS. (AEROSPACE TECHNOLOGY DIV. - LIBRARY OF CONGRESS) KATY VAN  
AUDIOVISUAL INSTRUCTION. FRANK TRAYNOR  
BIBLIOGRAPHIC INDEX. CODE 257  
BRITISH WELDING JOURNAL. CODE 872  
BUILDINGS. CODE 335  
CIRF ABSTRACTS CODE 164  
CHEMICAL ABSTRACTS. CODE 257  
CIVIL SERVICE JOURNAL CODE 160  
COMPUTING REVIEWS. CODE 950  
CONSUMER BULLETIN. CODE 257  
CONSUMER REPORTS. CODE 257  
CUMULATIVE BOOK INDEX. CODE 257  
DATA PROCESSING MAGAZINE. CODE 950  
DIRECTORY OF PUBLISHED PROCEEDINGS CODE 257  
ELECTRONIC TECHNICIAN. CODE 280  
ENGINEERING ALLOYS DIGEST. CODE 860  
ENGINEERING INDEX MONTHLY BULLETIN AND ANNUAL VOLUME. CODE 257  
ENENING CAPITAL, DAILY. CODE 107  
FEDERAL ACCOUNTANT. CODE 120  
FEDERAL TIMES. CODE 162  
FINANCIAL EXECUTIVE. CODE 125  
GOVERNMENT EMPLOYEES RELATIONS REPORT. CODE 160  
INSTITUTE OF METALS. JOURNAL. CODE 850  
IRON AND STEEL INSTITUTE. JOURNAL. CODE 850  
JOURNAL OF COLLEGE PLACEMENT. CODE 160  
JOURNAL OF METALS. CODE 850  
LABOR RELATIONS ADVISORY LETTER. CODE 163  
MACHINE AND TOOL BLUE BOOK. CODE 330  
METALLURGICAL REVIEWS. CODE 850  
METALWORKING NEWS. CODE 280  
MCODERN MATERIALS HANDLING. CODE 235  
MONTHLY CATALOG OF U. S. GOVERNMENT PUBLICATIONS. CODE 257  
NATIONAL ASSOCIATION OF SUGGESTION SYSTEMS. CODE 163  
NAVAL RESEARCH LOGISTICS. CODE 257  
NAVY CIVIL ENGINEER. CODE 310  
NAVY TIMES. CODE 107  
NEWSLETTER. CODE 230  
NEWSWEEK. CODE 210B  
CCUPATIONAL HAZARDS. CODE 163.1  
OFFICIAL AIRLINE GUIDE. CODE 128.1  
OFFICIAL AIRLINE GUIDE. QUICK REFERENCE. CODE 128.1  
OFFICIAL GUIDE TO THE RAILWAYS. CODE 128.1  
OPERATIONS RESEARCH/MANAGEMENT SCIENCE CODE 950  
PERSONNEL JOURNAL. CODE 160  
PURCHASING. CODE 230

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2. REPORT TITLE

**Mechanization Study of the U.S. Navy Marine Engineering  
Laboratory Library, Annapolis, Maryland**

3. DESCRIPTIVE NOTES (Type of report and inclusive dates)

**Final Report of on-site survey**

4. AUTHOR(S) (Last name, first name, initial)

**G. A. Kershaw, D. Crowder, J. E. Davis, E. G. Loges,  
E. Merendini, S. M. Thomas**

5. REPORT DATE

**September, 1966**

6. TOTAL NO. OF PAGES

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**0**

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11. OTHER REPORT NO'S. (Ans other numbers that may be assigned to this report)

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15. ABSTRACT

Computer mechanization at the U.S. Navy Marine Engineering Laboratory (MEL) Library presently consists of production of a journal listing on an IBM 1401 computer from punched cards. When the computer file of information on reports is expanded, it will be the data base for bibliographic searches and retrieval of information. This data base will be maintained and processed by the Information Storage Package, a series of computer programs developed by the Applied Physics Laboratory of Johns Hopkins University. The MEL Library feels that, while the Information Storage Package is useful, a universally accepted information system would be more beneficial for all aspects of library mechanization; with such a system, centralized cataloging might become feasible.

Security Classification

# Digital Computers Information Systems

## Libraries

KEY WORDS	LINK A		LINK B		LINK C	
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